Fryeburg Quadrangle, Maine

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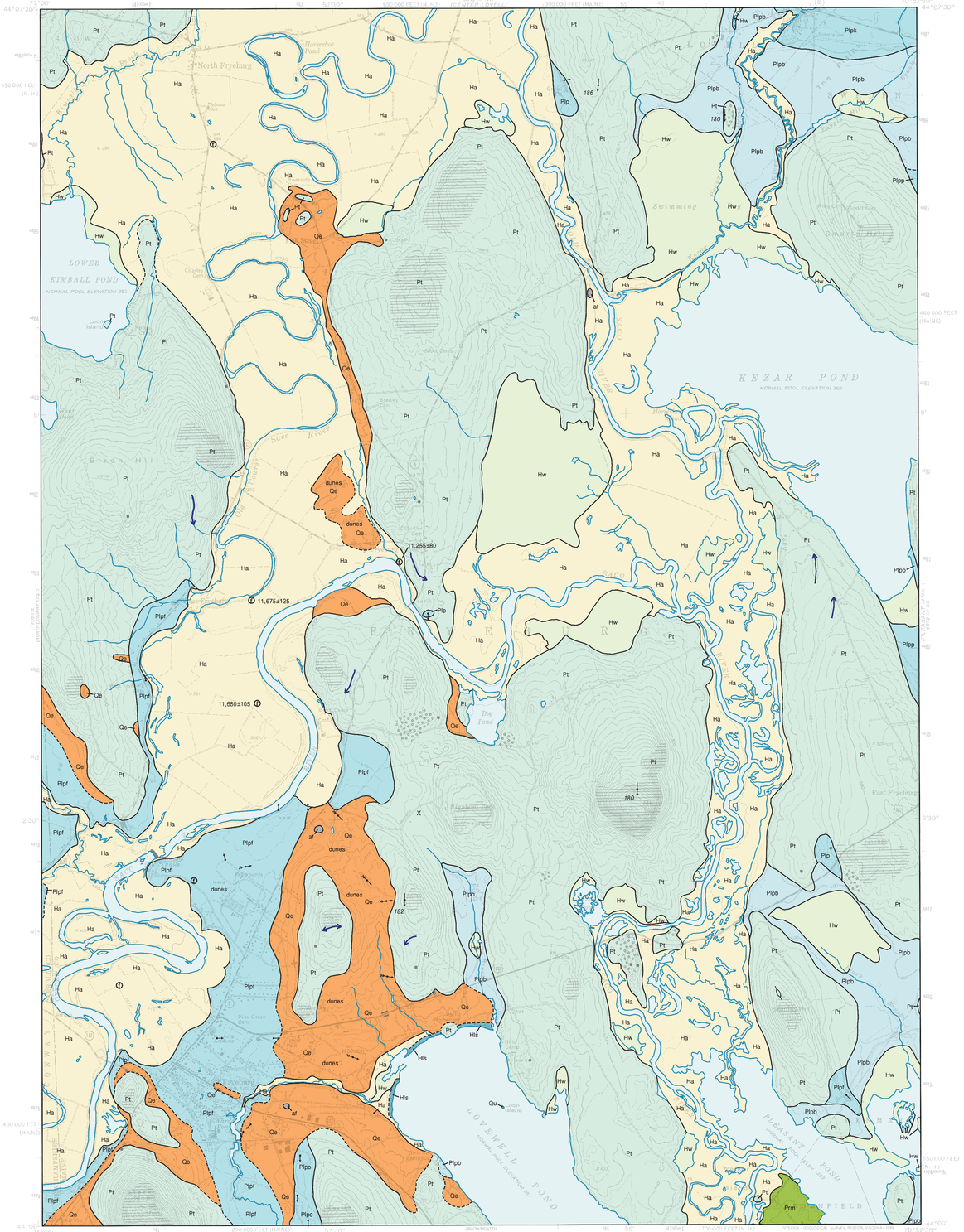
For additional information, see Open-File Report 99-8.

Surficial Geology



SOURCES OF INFORMATION

Surficial geologic mapping of the Fryeburg quadrangle was conducted by Woodrow B. Thompson in 1983 and 1986 for the Maine Geological Survey's sand and gravel aquifer mapping program. The author carried out additional field work in 1998-1999 to update earlier observations and complete this map.

Quadrangle Location

SCALE 1 : 24,000

1 0 1 MILE
1000 0 1000 2000 3000 4000 5000 6000 7000 FEET
1 0 1 KILOMETER

CONTOUR INTERVAL 20 FEET

TRUE NORTH

Topographic base from U.S. Geological Survey Fryeburg quadrangle, scale 1:24,000 using standard U.S. Geological Survey topographic map symbols.

The use of industry, firm, or local government names on this map is for location purposes only and does not impute responsibility for any present or potential effects on the natural resources.

Ha — **Stream alluvium** - Sand, silt, gravel, and organic material. Deposited on flood plains of modern streams and in stream channels. Unit includes large swampy areas on Saco River flood plain near Kezar Pond. Mapped contacts between alluvium and wetlands are very approximate in this area.

Hw — **Wetland deposits** - Peat, muck, silt, and clay. Deposited in poorly drained areas.

Hls — **Lake shoreline** - Sand and gravel deposited on the shoreline of Lovewell Pond.

Qe — **Eolian deposits** - Windblown sand. Forms dunes and irregular blanket deposits in the Saco Valley. Areas labeled "dunes" show dune morphology.

Lake Pigwacket deposits - Sand, silt, clay, and gravel deposited in successive stages of Lake Pigwacket during late-glacial to postglacial time.

Plpb - Lake-bottom deposits. Silt, clay, and sand deposited on the floor of Lake Pigwacket. Not differentiated according to lake stage.

Plpf - Fryeburg stage deposits. Fluvial and deltaic sediments deposited in a late stage of Lake Pigwacket in the Fryeburg area when the lake was dammed by earlier lake deposits in the Brownfield-Hiram section of the Saco Valley. Locally overlain by eolian sand, especially in the Fryeburg village area.

Plpk - Kezar Valley stage deposits. Sand, silt, and clay deposited in Lake Pigwacket by glacial streams in the Kezar River valley. Most deposits of this stage occur in the adjoining Center Lovell and North Waterford quadrangles.

Plpp - Pleasant Mountain stage deposits. Sediments deposited in Lake Pigwacket by glacial streams on the east side of the Saco Valley, in the vicinity of Pleasant Mountain. Most deposits of this stage occur in the adjoining Pleasant Mountain and Hiram quadrangles.

Plpo - Oak Hill stage deposits. Ice-contact sand, gravel, and silt deposited by glacial streams on the west side of Oak Hill. Located at head of outwash for morphosequence graded to Lake Pigwacket in the Saco Valley, south of Lovewell Pond.

Plp - Undifferentiated Lake Pigwacket deposits. Sand, gravel, and silt. Probably deposited by glacial streams that flowed into Lake Pigwacket, but relation to lake history is unknown.

Prm — **Ribbed moraine** - Ridges and hummocks of glacial till. Poorly sorted rock debris deposited by glacial ice. May contain lenses of water-laid sediments.

Pt — **Till** - Loose to very compact, poorly sorted, generally nonstratified mixture of sand, silt, and gravel-size rock debris deposited by glacial ice. Locally includes lenses of water-laid sand and gravel.

Qu — **Quaternary(?) deposit of unknown composition** (Loon Island in Lovewell Pond).

Bedrock outcrops/thin-drift areas - Ruled pattern indicates areas where outcrops are common and/or surficial sediments are generally less than 10 ft thick (mapped partly from air photos). Gray areas and dots show small individual outcrops.

af — **Artificial fill** - This unit identifies sawdust piles that are large enough to alter the contour pattern of the topographic map. Narrow strips of fill underlying roads have not been mapped.

Contact - Boundary between map units. Dashed where very approximate.

Glacially streamlined hill - Symbol shows trend of long axis, which is parallel to former ice-flow direction.

Glacial striation locality - Arrow shows ice-movement direction inferred from striations (scratches on bedrock caused by glacial abrasion). Dot marks point of observation. Number is azimuth (in degrees) of flow direction.

Dip of cross-bedding - Arrow shows average dip direction of cross-bedding in fluvial or deltaic deposits and indicates direction of stream flow or delta progradation. Point of observation at dot.

Sand dune - Arrow shows trend of dune axis or dip direction of slip-face bedding in dune and indicates inferred wind direction. Dot marks point of observation.

Meltwater channel - Channel eroded by glacial meltwater stream. Single arrow shows inferred direction of former stream flow. Double arrows indicate that flow direction is uncertain.

Large boulder - Site of exceptionally large glacially transported boulder.

Area of many large boulders

Fossil locality - Symbol shows locations where buried plant remains were found in test-boring samples. See text (Thompson, 1999) and materials map (Thompson, 1998) for additional site data.

USES OF SURFICIAL GEOLOGY MAPS

A surficial geology map shows all the loose materials such as till (commonly called hardpan), sand and gravel, or clay, which overlie solid ledge (bedrock). Bedrock outcrops and areas of abundant bedrock outcrops are shown on the map, but varieties of the bedrock are not distinguished (refer to bedrock geology map). Most of the surficial materials are deposits formed by glacial and deglacial processes during the last stage of continental glaciation, which began about 25,000 years ago. The remainder of the surficial deposits are the products of postglacial geologic processes, such as river floodplains, or are attributed to human activity, such as fill or other land-modifying features.

The map shows the areal distribution of the different types of glacial features, deposits, and landforms as described in the map explanation. Features such as striations and moraines can be used to reconstruct the movement and position of the glacier and its margin, especially as the ice sheet melted. Other ancient features include shorelines and deposits of glacial lakes or the glacial sea, now long gone from the state. This glacial geologic history of the quadrangle is useful to the larger understanding of past earth climate, and how our region of the world underwent recent geologically significant climatic and environmental changes. We may then be able to use this knowledge in anticipation of future similar changes for long-term planning efforts, such as coastal development or waste disposal.

Surficial geology maps are often best used in conjunction with related maps such as surficial materials maps or significant sand and gravel aquifer maps for anyone wanting to know what lies beneath the land surface. For example, these maps may aid in the search for water supplies, or economically important deposits such as sand and gravel for aggregate or clay for bricks or pottery. Environmental issues such as the location of a suitable landfill site or the possible spread of contaminants are directly related to surficial geology. Construction projects such as locating new roads, excavating foundations, or siting new homes may be better planned with a good knowledge of the surficial geology of the site. Refer to the list of related publications below.

OTHER SOURCES OF INFORMATION

1. Thompson, W. B., 1999, Surficial geology of the Fryeburg 7.5-minute quadrangle, Oxford County, Maine: Maine Geological Survey, Open-File Report 99-8, 20 p.
2. Thompson, W. B., 1998, Surficial materials of the Fryeburg quadrangle, Maine: Maine Geological Survey, Open-File Map 98-226.
3. Neil, C. D., 1998, Significant sand and gravel aquifers of the Fryeburg quadrangle, Maine: Maine Geological Survey, Open-File Map 98-193.
4. Thompson, W. B., 1979, Surficial geology handbook for coastal Maine: Maine Geological Survey, 68 p. (out of print)
5. Thompson, W. B., and Borns, H. W., Jr., 1985, Surficial geologic map of Maine: Maine Geological Survey, scale 1:500,000.
6. Thompson, W. B., Crossen, K. J., Borns, H. W., Jr., and Andersen, B. G., 1989, Glaciomarine deltas of Maine and their relation to late Pleistocene-Holocene crustal movements, *in* Anderson, W. A., and Borns, H. W., Jr. (eds.), Neotectonics of Maine: Maine Geological Survey, Bulletin 40, p. 43-67.